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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

151

Date: August 2, 1991

Subject: Biological Technical Assistance Group Review of Ecological Assessment,
Woodstock Municipal Landfill, Woodstock, Illinois.

From: Douglas Beltman, Co-coordinator *DBeltman*
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To: Robert Swale, RPM
IL/IN #2

On July 11, 1991, the Regional Biological Technical Assistance Group (BTAG) held a meeting to discuss the Ecological Risk Assessment for the Woodstock Municipal Landfill Superfund Site. A meeting attendance list is attached. BTAG comments and recommendations concerning the Risk Assessment are provided below.

General Comments

Overall, we found this to be a very poor ecological risk assessment. All aspects of the assessment, from selection of contaminants of concern to risk characterization, are lacking. It seems that this document was not written by a qualified ecological risk expert, and we are concerned that the contractors have the personnel necessary to conduct an acceptable ecological risk assessment.

The RI Report does not include Table 9-6, which presents the results of the risk assessment. This table is obviously crucial in the risk assessment. Omission of this important table reflects the overall quality of this document.

Specific Comments

§ 9.2 Ecological Site Description

1) page 2: This description describes developed areas north and east of the landfill, but poorly describes landcover types and uses of apparently less developed areas to the south and west.

2) page 3, ¶ 2: The surface vegetation of the landfill is described as being mostly grasses and herbaceous species, yet no grass species are listed as dominants.

3) page 3, ¶ 3: The size of these depressions should be given, and a sound determination as to whether they are jurisdictional wetlands should be provided.

4) page 3, ¶ 4: Lists of animal species using the site are not very thorough or complete.

5) page 3, ¶ 5: Total wetland acreage surrounding the site, not just within site boundaries, should be given. Also, these wetlands should be classified according to the system in Cowardin et al., 1979, Classification of Wetlands and Deepwater Habitats of the United States, U.S. Fish and Wildlife Service, FWS/OBS-79/31. The classification used in this risk assessment is not clear.

§ 9.3 Chemicals of Potential Concern

6) All pertinent RI sections, data tables, and figures which detail the nature and extent of contamination must be referenced where necessary.

7) Selection of chemicals of concern should be included for terrestrial habitats, i.e. the landfill itself.

8) page 5, ¶ 1: SW-01 is described as coming from a seep area, but Figure 4-1, which shows "groundwater seeps", does not show location SW-01 as a seep. This seriously calls into question whether SW-01 is an appropriate sample to represent landfill seeps.

9) page 5, ¶ 1: We are concerned with the low number of wetland surface water samples (i.e., one) upon which this risk assessment is based. This low number of samples introduces large amounts of uncertainty into the risk assessment, which must be dealt with in a conservative manner.

10) page 5, ¶ 1: The text should clearly state that organics were not analyzed for in the creek surface water.

11) page 5, ¶ 1: The selection process for Contaminants of Concern should be fully explained. (see next two comments)

12) page 5, ¶ 1: Based on the data Tables in Appendix F-6, iron concentrations in wetland water also is (far) greater than 2 times background, assuming SW-10 was used as background. The high level of iron in wetland surface water (32,200 ug/L) makes iron another contaminant of concern that should be included in the overall assessment. At these high levels, iron is certainly not "low in toxicity".

13) page 6, ¶ 1: Based on our professional judgements concerning contaminant concentration levels and toxicity, arsenic, lead, and nickel should be added to the list of contaminants of concern for sediments. These contaminants should also be carried through in the risk assessment.

§ 9.4 Exposure Assessment

14) For the muskrat and meadow vole, the exposure assessment considers only uptake through incidental ingestion of contaminated soil. Contaminant exposure via consumption of contaminated plant food must also be considered. Information on plant uptake of contaminants from soils is available in the scientific literature. A literature search should reveal relevant information.

15) page 7, ¶ 2: A discussion of the potential for shallow groundwater to contribute contamination to the wetlands, which are shallow groundwater discharge areas according to the RI, should be included.

16) page 7, ¶ 3: Claims concerning plant or animal exposure to surface water should include such relevant information as the time of year that no standing water was observed and the amount of prior recent rainfall for the area. Even though certain areas did not have standing water at the time of RI field activities, exposure to surface water is still possible at other times of the year.

17) page 8, ¶ 1 and 3: Amphibians and reptiles are also exposed to wetland sediments and waters.

18) page 9, ¶ 1 and 2: This ecological assessment earlier states that "species are selected to be representative of other populations in the site environment", yet commercial and social value is used as the main criterion for selection of species of concern. The species selected, meadow vole, muskrat, and bluegill, are acceptable, but the selection criteria are inconsistent with earlier statements. Because of the contamination of wetland sediments, benthic invertebrates should also be included as "species" of concern. Their inclusion should be as part of the assessment of risks to the bluegill, a predator of these macroinvertebrates. In other words, impacts to the food source of the bluegill from contaminants must be considered when assessing impacts to the bluegill.

19) page 10, ¶ 2: Concluding that surface water exposure to site species is minimal because surface water contaminant concentrations are less than sediment concentrations is completely inappropriate. Concentrations cannot be compared among media to determine relative exposure. For instance, gill exchange in fish from the water column is often a much more significant route of uptake than from incidental ingestion of more contaminated sediments. Direct contact with surface water must be included as a route of exposure for fish and benthic macroinvertebrates (see comment # 26 regarding the use of Ambient Water Quality Criteria). Surface water as a drinking water source for the muskrat and small mammals must also be included in analysis.

20) page 10, ¶ 3: Assumptions regarding animal life history attributes should be properly referenced.

21) page 10, ¶ 3 and 4: The percent of diet consumed as soil assumed for the vole and muskrat should be specified.

22) page 11, ¶ 1: As previously mentioned, the potential for gill exchange uptake for bluegills, not just dietary intake, must be considered.

23) page 11, ¶ 1: Bioconcentration factors must also be applied to sediment macroinvertebrates, for they also can bioaccumulate contaminants. Bioconcentration factors for all the contaminants of concern, particularly mercury which is known to bioaccumulate, must be applied to surface water and sediment concentrations. Bioconcentration factors are available from the literature for freshwater invertebrate uptake of various metals of concern. The EPA's AQUIRE database, which contains over 100,000 entries of aquatic toxicity information, could be accessed through a commercial literature search service.

24) Table 9-2: The exposure potential for "surface absorption" ("direct contact" would be a clearer term) via surface water is not low for fish, aquatic vegetation, invertebrates, and amphibians (see comment # 19).

25) Table 9-2: The correct label is Kishwaukee Creek, not Kishwaukee River.

§ 9.5 Toxicity Assessment

26) A comparison of site surface water contaminant concentrations to EPA's Ambient Water Quality Criteria must be included to assess the potential for surface water to impact aquatic biota.

27) page 11, ¶ 2: No ecological endpoints were designated for the species of concern, so criteria pertinent to them could not have been selected.

28) page 11, ¶ 3: A more thorough search of the literature would give more information on the aquatic toxicity of all the contaminants of concern.

29) page 11, ¶ 4: Although the Apparent Effects Threshold approach is certainly a valid approach to assess sediment toxicity, specific values derived for the Puget Sound in Washington state cannot be used as benchmark or criteria values for this freshwater wetland and creek in Illinois. Such a comparison is meaningless. The Apparent Effects Threshold is an approach or method of evaluating sediment toxicity, not a development of nationwide sediment criteria based on Puget Sound data.

30) page 12, ¶ 1 and Tables 9-3 and 9-5: The relation between Tables 9-3 and 9-5 should be clearly explained, for it is not clear what toxicity benchmarks are being used for each species of concern or why. Also, the conversion between the different units of the two tables is incorrect: for DEHP, increased relative liver weight in guinea pig is given as occurring at 0.02 mg/kg/day in Table 9-5, and 20,000 ug/kg/day in Table 9-3.

31) page 12, ¶ 1, and Tables 9-3 and 9-5: The toxicity concentrations for the bluegill, based on limits to growth, apparently are ambient water concentrations, not food intake values. Ambient water concentrations cannot be compared to ingestion rates to assess toxicity. This point seems to be addressed on page 13, ¶ 4, but it is unclear exactly how this problem was handled. Effects of food ingestion rates on bluegills are available for some contaminants of concern from the literature.

§ 9.6 Risk Characterization

32) page 12, ¶ 2: Table 9-5 does not include population data, as the text claims. The endpoints provided in Table 9-5 are selected individual-level effects.

33) Table 9-4: Again, all assumptions regarding animal life-history features must be properly referenced.

§ 9.7 Summary

34) page 14, ¶ 3: This summary should be rewritten following acceptable changes in the risk assessment. Also, management of the Kishwaukee Creek as an aquatic resource is not the goal of Superfund. Editorial comments such as this one, with the obvious intent to downplay the importance of contaminant effects on biota, are completely inappropriate.

If you have any questions, please contact me at 6-5902.

cc: BTAG members